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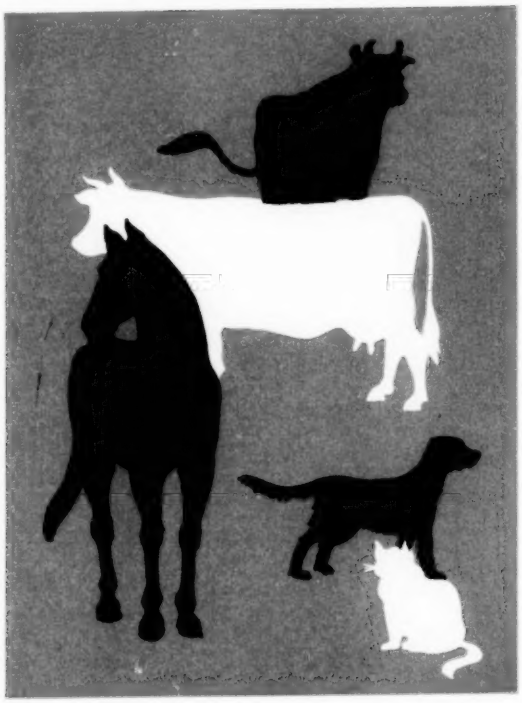

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Moniliasis in Artificially Reared Pigs and its Treatment with Nystatin

BY

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SUMMARY.—The incidence of "thrush" (moniliasis) due to infection by Candida albicans *in artificially reared piglets is described. Observations on the mortality rate indicate it to be in the region of 50 per cent. of those infected although predisposing factors are probably important both in relation to the onset and course of the disease.*

The nature and extent of the lesion is described, particularly the marked tendency of the causative organism to produce its effect on the stratified squamous epithelium of the alimentary tract.

The results of experimental treatment with Nystatin are given and the possible significance of the use of antibiotics in the feed as a predisposing cause discussed.

Introduction

FOLLOWING the occurrence of a case of "thrush" in a piglet reared from 2 days of age in a cage (McCrea & Osborne, 1957) no further cases were recorded for 6 months. In the period from July, 1956, to December, 1957, however, lesions of moniliasis have been noted in 41 piglets reared artificially for the purpose of nutrition experiments; of these, 25 died. The purpose of this paper is to record the circumstances under which these cases occurred and some observations on experimental treatment with Nystatin.

Management and Incidence

The piglets were weaned at 48 hours of age onto a semisynthetic diet basically consisting of maize starch, casein, sucrose, dried whole milk, dried yeast, minerals, and vitamins to which procaine penicillin was added at a level of 0.0015 per cent. For the first 3 days cow's milk was added; thereafter the diet was mixed with water on an equal basis by weight. During the subsequent period of experiment the pigs were fed on a ration scale based on liveweight. The majority were housed in cages but some were immediately placed in concrete-floored pens subdivided by metal partitions into units holding up to 6 pigs. The partitions rested on the floor but did not prevent the seepage of urine from pen to pen. For bedding, sawdust or shavings were used sparingly. The material tended to become damp around the water and wet mash troughs and also in the area of the pens where defaecation and urination occurred. Infra-red lamps were used and under these the bedding remained dry. Caged pigs were moved into pens at 4 weeks of age but the majority of cases of thrush occurred in those pigs reared in pens from the start of the experiment and very few cases were seen in pigs in cages.

During the period 140 pigs were brought into the rearing unit and 93 survived to 8 weeks of age—a mortality of 33.6 per cent. Lesions of moniliasis were present in 25 of the 47 which died giving a mortality of 17.8 per cent. due to this cause. Since an additional 18 cases in which lesions were seen in the mouth recovered, the known morbidity was 43 out of 140 or 30.7 per cent. However, only half of the fatal cases showed lesions visible in the mouth so that a morbidity of well over this figure may be assumed.

The age at which the animals died ranged from 10 to 56 days with a mean of 26 (see Fig. 1). Although cases have occurred at all seasons the highest incidence was seen in the months of June, July, and August—19 out of 26 fatal cases.*

* Including the original case described.

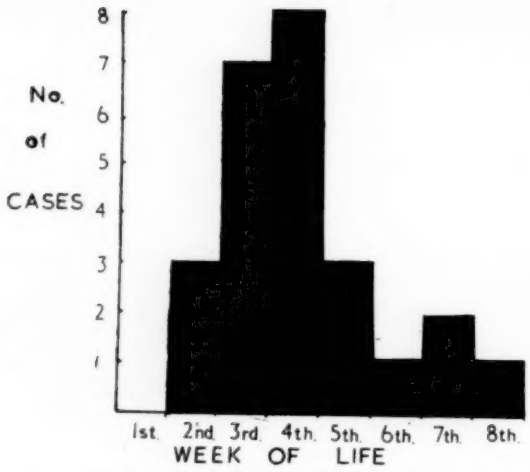

FIG. 1.—Age of death of 26 fatal cases of moniliasis.

Symptoms

Dullness and inappetence were first noted and in some cases vomiting occurred. The majority of the piglets also showed a blackish-grey or more rarely a yellow or green diarrhoea, the colour apparently being related to the nature of the diet. Examination of the mouth revealed lesions in many cases, particularly on the tongue but also on the posterior hard palate.

Death occurred suddenly or after an illness lasting as long as 2 weeks. The majority of fatal cases lived less than a week after the onset of symptoms however.

Pathology

Lesions were present in either the mouth, oesophagus, or stomach, or a combination of these sites. In the mouth they took the form of creamy white or yellow white, smooth or wrinkled, soft material overlying the mucous membrane. The tongue, pharynx, soft and hard palate were affected in that order of frequency. The extent of this covering varied from small circular areas 2 to 5 mm. in diameter and resembling colonies of a Candida on malt agar, to areas several centimetres in extent (Plate I). A frequent site was the median glosso-epiglottic fold.

In the oesophagus the peculiar lesions seen in the original case have not been observed but most cases have shown lesions confined to the posterior half of the oesophagus, especially the last few centimetres, and varying in extent from 2 to 10 cm. along its length. The false membrane was not ballooned but firm in appearance though soft to touch and often longitudinally corrugated. The absence of a honeycomb effect may be explained by the relative infrequency of mucus glands in the second half of the oesophagus of the pig. The mucosal covering varied in thickness and in some cases tended to occlude the lumen; in these cases the oesophagus showed a definite distension. When the false membrane was removed from the affected areas in the mouth and oesophagus, as was possible with relative ease, the underlying mucosa showed mild to moderate congestion but no macroscopical evidence of ulceration.

In the stomach lesions were almost wholly confined to the oesophageal area although a very few cases showed true involvement of the glandular areas. Many stomachs showed the presence of opaque mucoid material tenaciously adherent to the mucosa in the diverticulum, cardiac area, or fundus, but whilst numerous yeast cells were seen in smears from this material no inflammatory process could be detected histologically.

In the rest of the alimentary tract inflammation of either the small or large intestine or both was often present but no membranes were seen. The remaining body organs showed slight degenerative changes but no gross lesions.

Histology

The superficial layers of the stratified squamous epithelium of the tongue showed degenerative changes with desquamation. In some areas epithelial hyperplasia had occurred increasing its thickness to twice normal whilst in others desquamation left a layer 2 to 4 cells thick (Plates II and III). Occasionally the underlying subepithelial tissues were exposed.

Desquamated epithelial cells mixed with yeast cells, pseudo-hyphae, and neutrophils formed the detachable portion of the lesion (Plates IV and V). In the submucosa capillary congestion was present with infiltration of neutrophils, plasma cells, lymphocytes, and eosinophils.

In the oesophagus and oesophageal zone of the stomach the change was in general less severe and more superficial, although occasionally superficial ulceration of the mucosa was noted (Plate VI).

In sections stained with the Periodic acid-Schiff method, yeast cells and pseudo-hyphae were demonstrated, the latter penetrating into, and on rare occasions through, the epithelial layer (Plate VII). In areas of penetration by pseudo-hyphae the cellular reaction was not any more severe than in other areas—an observation in accordance with the findings of Hill and Gerhardt (1956) in mice.

Cultural Examination

In all cases cultures were made from the affected areas of the mouth, oesophagus, and stomach and in some cases from other areas of the stomach by direct streaking onto 3 per cent. malt agar plates (containing 20 units penicillin and 40 units streptomycin per ml. of medium). Cultures were also made from the inflamed areas of the intestine and in some cases from liver, kidneys, or heart blood. Incubation was continued for up to one week at 27° C. and yeast-type colonies subcultured for identification. Where many cases occurred over a short period diagnosis of the condition was made on the appearance of the lesions followed by demonstration of yeast forms and pseudo-hyphae in smears and the culture of numerous typical yeast colonies, but exact identification of the yeast was not made in every case.

A. D. OSBORNE, M. R. McCREA & M. J. MANNERS—MONILIASIS IN ARTIFICIALLY REARED PIGS AND ITS TREATMENT WITH NYSTATIN

PLATE I.—Mouth of piglet showing diffuse lesions on tongue (printed from Kodachrome transparency).

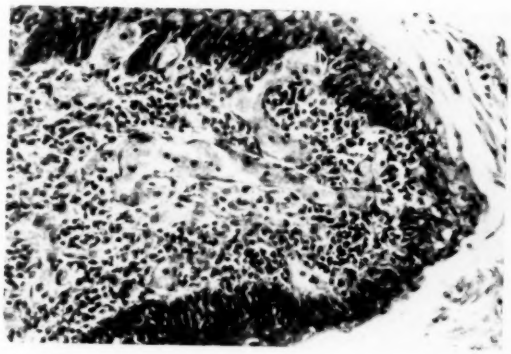

PLATE III.—Higher power of II showing congestion and cellular infiltration. H. & E. × 150.

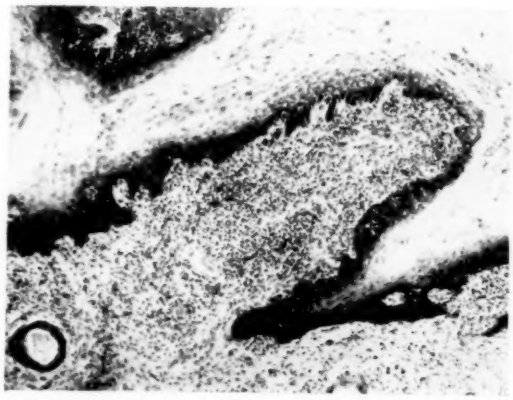

PLATE II.—Section of dorsum of tongue showing cellular infiltration and desquamation of epithelium of a papilla. H. & E. × 63.

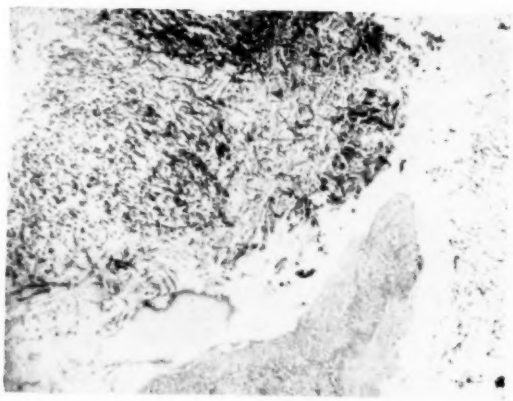

PLATE IV.—Tip of papilla of dorsum of tongue showing overlying cellular debris and pseudo-hyphae. P.A.S. × 63

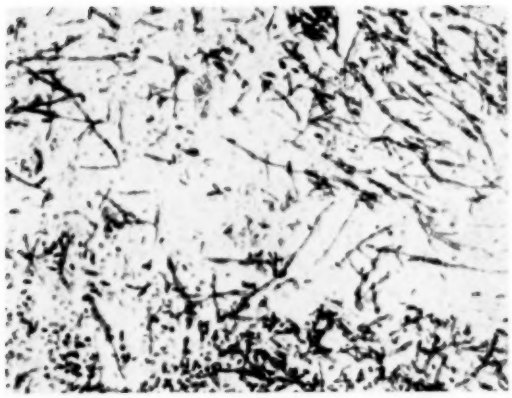

PLATE V. Higher power of IV showing yeast forms and pseudo-hyphae. P.A.S. × 160.

PLATE VI. Section of fold between oesophageal area of stomach and diverticulum showing hyperkeratosis of stratified squamous epithelium and central ulceration. Glandular epithelium is normal. Green Masson × 3.5.

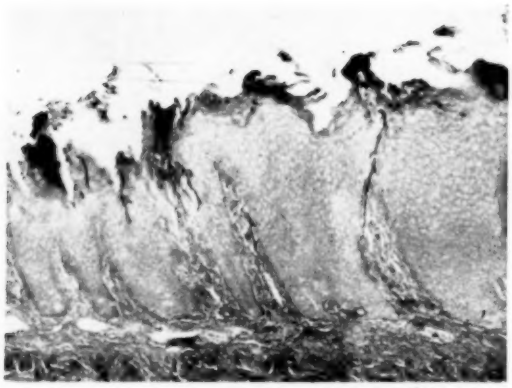

PLATE VII.—Base of tongue showing pseudo-hyphae penetrating deep into the epithelium and reaching the subepithelial tissue. P.A.S. × 60.

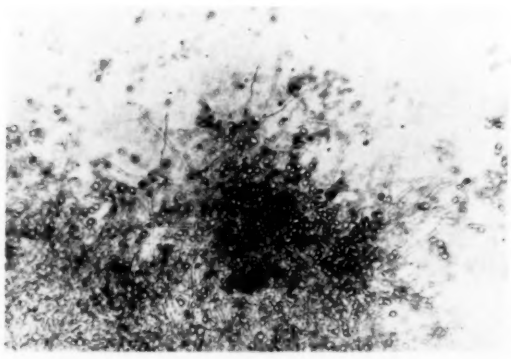

PLATE VIII.—Wet preparation of stomach contents of piglet treated with large oral doses of chloramphenicol showing numerous yeast cells and pseudo-hyphae. × 164.

In addition to mycological culture 5 per cent. ox-blood agar plates and MacConkey agar plates were inoculated with material from the lesions and intestines as well as from the internal organs previously mentioned. These plates were incubated aerobically at 37° C. for up to 3 days.

At least 4 species of yeast were isolated from affected animals, *Candida albicans, C. krusei, C. tropicalis,* and *C. slooffii,* but the most common isolate from the various sites where lesions were seen was *C. albicans.* This organism was isolated from the intestinal contents on a number of occasions and on one occasion from the kidney. Of the other yeasts occasional isolation of *C. tropicalis* and *C. slooffii* were made from the lesions and *C. krusei* from the faeces. The latter species was obtained from the kidney on one occasion and from plates exposed to the oral exhalation of squealing piglets showing mouth lesions.

A haemolytic strain of *E. coli* (O.K. 57 of Sojka *et al.,* 1957) was isolated from the small and/or large intestine in almost every case and frequently from the oesophageal and stomach lesions but only rarely from liver, kidney, or heart blood.

Treatment

Until recently the commonest method of treatment of "thrush" in man appears to have been the application of crystal violet or other antiseptic agent to the visible lesions. Similarly the recommendation is made by Hutyra *et al.* (1949) that the mouths of affected animals be treated with iodine in glycerine after irrigation with 1 per cent. sodium bicarbonate. In view of the presence of oesophageal lesions in almost all cases this type of treatment did not seem to be indicated. We were therefore fortunate to be able to obtain a supply of Nystatin, an antibiotic prepared from *Streptomyces noursei* (Hazen & Brown, 1950).

At first this was given in the form of a tablet containing 500,000 units, the recommended dose varying between 30,000 and 150,000 units per kilogramme. Later a suspension containing 100,000 units per c.c. was used to ensure direct contact with the lesions from the mouth onwards. Dosage was repeated twice daily for 3 to 4 days.

The results of treatment in the first cases where the antibiotic was used were indefinite and there was evidence of recurrence of symptoms within three days of cessation of treatment in some animals.

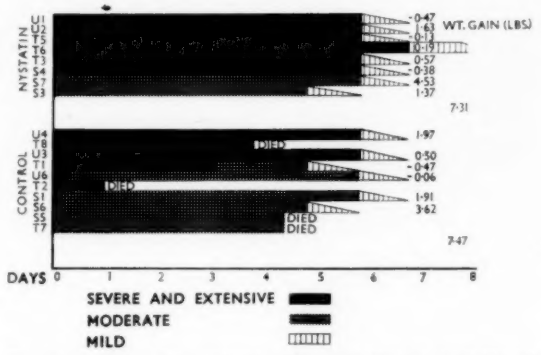

FIG. 2.—Effect of treatment with Nystatin on severity of lesions in 18 piglets affected simultaneously.

Opportunity to make a more extensive control test was presented when an explosive outbreak occurred in a group of 18 animals. Of these 8 were treated with Nystatin and 10 left as controls. Whilst 4 of the control group died and all of those treated survived (see Fig. 2), observations on the persistence of lesions in the mouth and their relatively rapid disappearance over a period of 1 to 2 days in both groups at the termination of a 6- to 8-day illness tended to diminish the suggestion of an effect of treatment, particularly if one compares the more spectacular results reported in man (Drouhet, 1955). A comparison of weight gain in the survivors of the control group and the treated group also failed to show a significant difference. In fact the controls, gaining on average 1.245 lb. over 6 days, did better than the treated animals which gained only 0.914 lb. in the same period. Whether more frequent treatment as carried out in man would be of more value is not known.

The Effect of Antibiotics on Incidence

Many reports have been published on the effect of antibiotic therapy on the incidence of "thrush" in man (Stewart, 1956), and others have indicated the connexion between such treatment and high faecal yeast counts (Sharp, 1956; Windisch & Staib, 1955). Experimental infection of the digestive tract of rabbits and mice with *Candida albicans* has been found possible only after the administration of antibiotics. (Drouhet & Simmonet, 1956; Hazen, Brown & Little, 1955; Huppert, Cazin & Smith, 1955).

Despite the extensive use of antibiotics in animals no increase in cases of moniliasis has been reported. Even though penicillin was incorporated in the ration of the majority of the piglets under experiment the level was very low compared with that used in human therapy and we were therefore not convinced that this was a significant predisposing cause. Support to these doubts was obtained in the outbreak involving 18 piglets. Six of these were fed a ration supplemented with oxytetracycline* (level

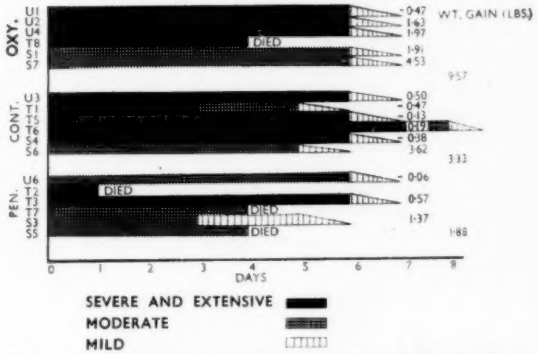

FIG. 3.—Incidence and severity of lesions in animals on diets supplemented with oxytetracycline and penicillin compared with control.

* Terramycin: Pfizer.

0.0049 per cent.), for 6 others the supplement was penicillin at the 0.0015 per cent. level, and 6 were fed the basic ration as controls. The incidence and severity of cases and persistence of lesions is demonstrated in Fig. 3, which indicates no significant difference except possibly a higher death-rate in the penicillin group. Most experimental work suggests that wide spectrum antibiotics are more likely to predispose to yeast infection. This is not confirmed for pigs when the diets used for the 3 groups concerned in this outbreak are considered. Nevertheless in a group of 12 animals more recently treated with chloramphenicol* at therapeutic levels 2 cases of typical "thrush" (1 fatal) were seen and 1 other animal died of an acute yeast tympany. The majority of the animals were given 3 daily oral doses of chloramphenicol at the rate of 250 mg. for a 10-lb. pig and the animal which died did so 7 days after the last dose. In the case of the animal showing acute tympany this died within 12 hours of the last of 3 doses given over a period of 36 hours. The stomach contents of this animal were frothy and almost watery in consistency and showed numerous yeast cells (Plate VIII). There would seem to be some correlation in these cases between oral dosing with relatively large amounts of antibiotic and encouragement of the growth of the yeasts.

Discussion

Moniliasis is recognised as a disease of poultry although few outbreaks have been recorded. This condition has been recorded in the cow as a systemic infection (McCarty, 1956), and has also been seen in a puppy (Payne, 1958). Despite a small number of recent reports (Kovalev, 1947; Quin, 1952; Gitter & Austwick, 1959) and very occasional references to the condition in earlier literature (Hutyra, Marek & Manninger *loc. cit.*, Poenaru, 1911), the condition would also appear to be rare in piglets. Although diets supplemented by small amounts of antibiotics have only been in use during the last few years the results discussed above together with a scarcity of reports from the field would suggest that the relatively small amounts of antibiotics used do not alter the normal gut flora sufficiently to predispose to infection by *C. albicans*.

In man and poultry devitalising factors are often incriminated in cases of thrush (Drouhet, 1957; Blaxland & Fincham, 1950), and in the cases encountered by us the very frequent association of enteritis either preceding or accompanying the fungal condition has been noted. This was apparently the result of a heavy infection by *E. coli* of the strain O.K.57 and such a combination is interesting in view of the report of Gale and Sandoval (1957) of an enhancement phenomenon produced in mice by the injection of *E. coli* or its toxin in association with *C. albicans*. It may therefore be that a low-grade toxaemia produced by this known toxicogenic strain of *E. coli* has been a predisposing factor.

At the same time the disease has mainly been seen in piglets reared on an artificial diet rich in sugar (either in the form of lactose or sucrose). There is evidence of multiplication of yeasts both in the food and in drinking water contaminated by the food, yeasts other than *C. albicans* being obtained in large numbers on culture from these sources.

During the period of feeding with semi-liquid material the food bowl was often placed under the infra-red lamp where the temperature was 20° to 22° C. This may have encouraged multiplication of the yeasts. Also the water containers were only sterilised between batches of pigs and food material washed off the mouth tended to settle in the water and form a nutrient medium.

In an attempt to isolate *C. albicans* emulsified food from the trough, water and scrapings from the bottom of the water trough, litter, washing from flies caught in the animal house and emulsified flies were all cultured by streaking onto malt agar. No *C. albicans* could be identified but other yeasts were obtained; *C. brumptii* from feed and floor litter; *C. tropicalis*, *C. krusei*, *Torulopsis candida*, and *Debaromyces kloeckeri* from the water; *Debaromyces kloeckeri* and *Saccharomyces exiguus* as well as an unidentified Saccharomyces from the food and an unidentified Candida from food, water, and flies.

Despite our inability to obtain *C. albicans* from other sites its ability to survive outside of the body is demonstrated by the report of Gitter and Austwick (*loc. cit.*).

Nevertheless, the mere multiplication of the organism outside the body would seem unlikely as the main factor predisposing to the disease in view of the difficulty of its reproduction by administration of yeasts orally, or by stomach tube (Austwick, 1958). A more reasonable assumption would seem to be a possible enhancement of the keratolytic properties of the yeast by the sugars in the milk substitute (Kapica & Blank, 1957).

Whilst there would seem to be no doubt that extensive lesions in the mouth and terminal portion of the oesophagus could be responsible for inappetence and vomiting we feel it to be unlikely that infection by *Candida albicans* is of primary significance and that in most, if not all, cases some predisposing factor is involved.

Acknowledgments.—We are extremely grateful to Mr. P. K. C. Austwick of the Central Veterinary Laboratory, Weybridge, for help both in identifying the strains of Candida and with general advice. We also acknowledge the generous provision of supplies of Nystatin made available to us by Mr. W. W. Heseltine of E. R. Squibb & Sons. Considerable assistance with routine *post-mortem* examinations was given by Mr. L. N. Payne. Photography was carried out by Mr. R. S. Undrill.

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* Chloromycetin: Parke-Davis.

Acute *Ostertagia ostertagi* Infection in Young Cattle and its Successful Treatment with O,O-Dimethyl 2,2,2-Trichloro 1-Hydroxymethyl Phosphonate*

BY

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AND

R. L. MITTON

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SUMMARY—(1) *O,o-dimethyl 2,2,2-trichloro 1-hydroxymethyl phosphonate* proved highly effective in an epidemic of severe* Ostertagia ostertagi *infection in calves from 1 to 11 months of age, on pasture.*

(2) *Dose rates of 80 mg. per k. or above gave excellent clinical results, but 69 mg. per k. was too low.*

(3) *Alarming symptoms of poisoning were common soon after therapeutic doses, but usually passed off spontaneously in a short time.*

Poisoning was not related to dose rate, age, bodily condition, pre-medication, sex or feed, within our conditions.

(4) *The poisoning was rapidly reversed by atropine sulphate (8 mg. by slow intravenous injection), except in one anomalous fatal case. This antidotal treatment did not adversely affect the anthelmintic value of the "Neguvon."*

(5) *Clinical and* post mortem *appearances are described.*

(6) *It was estimated that the minimum number of* Ostertagia ostertagi *likely to be associated with serious disease in a calf 6 to 9 months old was of the order of* 50,000 *to* 80,000; *and in a calf 1 month old, of the order of* 10,000 *to* 12,000. *Limited observations suggested that* Cooperia oncophora *was less pathogenic.*

(7) *The only animals affected were those under the age of 11 months. They had been born during an abnormally dry season.*

(8) *Successful treatment did not appear to decrease resistance to reinfection.*

* ("Neguvon" Bayer).

Introduction

WHILE the nematode *Ostertagia ostertagi* is a common parasite of cattle, it does not often cause epidemics of severe disease, and for this reason there is little information in the literature about treatment of serious infections, although the efficacy of various anthelmintics against mild infections has been widely studied (Banks & Michel, 1959; Baker, Allen & Douglas, 1959; Galvin, Bell & Turk, 1959; Riek, 1958; Swanson, Stone & Wade, 1957; and Vegors *et al.*, 1958). This paper records (a) our experiences in a violent epidemic characterised by high mortality in untreated animals, (b) successful treatment with "Neguvon" Bayer, and (c) some aspects of the toxicology of the drug.

Technical Methods

The methods of counting worm eggs in faeces and of cultivating larvae were those of Roberts and O'Sullivan (1950), and larvae were indentified according to Keith (1953). However, with the watery or frothy faeces of some of our cases egg counts as recorded should be treated with reserve.

The numbers of worms present in the abomasum or the small intestine were estimated by a dilution technique from the total contents of each of these organs, together with the material gently rubbed and washed off the mucosa.

Moniliasis in Artificially Reared Pigs and its Treatment with Nystatin.—*Concluded.*

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In all cases where we quote dose rates the animals were weighed, as we found that weights estimated by inspection were inaccurate, usually being well under the true figure. Dose rates are in milligrams of drug per kilogram of body weight.

In some of our early cases we preceded treatment with a dose of 60 ml. of 10 per cent. sodium bicarbonate (" premedication ") in order to close the oesophageal grove and direct the anthelmintic into the abomasum (Riek, 1954). However, it became evident that the drug gave excellent results without premedication, which we therefore discontinued.

District and Climate

The epidemic occurred in the Adelaide Hills, a good dairying and mixed farming area at an elevation varying from 500 to 1,500 feet above sea level, and having a climate of Mediterranean type, but with some effective summer rainfall. Cattle are maintained throughout the year, with some supplementary feeding in summer, on permanent improved pastures based on subterranean clover and rye grass.

Course of the Epidemic

The epidemic began early in June, 1958, with a number of simultaneous outbreaks of sudden onset. Only young cattle, from 4 weeks to 11 months of age, were attacked, older animals being apparently immune, even those which had been sharing pasture with affected animals for some months. In some outbreaks all or nearly all the young animals on the farm were affected, but whatever the incidence, the cases on any one property generally appeared within a few weeks of each other. The epidemic was not allowed to run its course as our treatment proved highly effective, but before treatment was established some of the fulminating outbreaks ended with the death of the whole calf-crop, or with its condemnation as " runts."

Fresh outbreaks continued to be reported during the period July to October, and there was a recrudescence in November on a farm where some of the first cases had been seen.

Seasonal Conditions Relative to the Epidemic

It is perhaps significant that unusual weather was experienced in the 10 months preceding the first cases, that is from August, 1957, to May, 1958. This period of spring, summer and autumn was so dry as to cause serious concern over feed supplies.

The normal autumn/winter rains began early in May, 1958, and rain fell throughout this month, about double the normal being received; at Mount Barker, which may be taken to represent the district, 7.84 inches fell, compared with the normal 3.49. This rain, combined with the mild temperatures experienced during the month, brought on a good growth of pasture.

June was abnormally dry (0.78 inches compared with normal 4.06) and very cold, the frosts being so severe that all growth stopped, the cattle soon had the pastures eaten down, and feed supplies again began to cause concern in the district, but not on all farms, and we must emphasise that some calves were on good feed when affected. The weather from July onwards did not diverge greatly from normal and is summarised below; the figures are total monthly rainfall in inches at Mount Barker, the first of each pair being that recorded in the season under review, the second (in brackets) being the normal. July to October—wet, and cold or cool—4.50 (3.99); 4.72 (4.22); 4.99 (4.00); 4.33 (2.88); respectively. November—dry and warm—0.95 (1.67).

Clinical Observations

In severe cases the first symptom was diarrhoea, developing suddenly in animals which had been in quite good condition, or even fat. The faeces soon became watery or frothy, and usually ill-smelling. In a few days there was extreme weakness and loss of flesh, appetite was greatly reduced or absent, signs of dehydration were evident, and the calves presented a wretched appearance in striking contrast to their recent condition. Death occurred within 1 to 3 weeks.

Subacute cases showed a similar range of symptoms, but in less degree. We think that some of these animals recovered spontaneously after a comparatively short illness, but the great majority received a serious setback, and took weeks or months to regain their previous bodily condition.

Some mild or doubtful cases were also seen, and on most affected properties there were calves which showed no symptoms although apparently susceptible and certainly exposed to infection.

Differential Diagnosis

General

(a) We considered that " mucosal disease " was the most likely diagnostic trap for the veterinarian in a busy practice, but in fact we saw little of this disease and it presented no real problems. Nutritional upsets were quite common, as might be expected from the feed conditions and the weather, but they were neither severe nor of particularly sudden onset, and of course soon disappeared when the calves were given suitable feed, together with sulphonamides when a complicating Salmonella infection was suspected.

Post-mortem *examinations*

(b) These usually gave an immediate diagnosis, for instance:—

Calf 746, 6 to 9 month old, died after about 10 days illness. The abomasal mucous membrane was swollen to about three times the normal thickness: 150,000 Ostertagia were counted in the contents of the abomasum, and a further 4,000 in the small intestine.

Calf 887, about 9 to 10 months of age, died a week after first being noticed seriously ill. The abomasal mucous membrane was swollen, and partly covered with a pseudomembrane. 120,000 mature adult Ostertagia, with 30,000 immature forms, were counted in the contents of the abomasum, and 8,000 *Cooperia oncophora* in the small intestine. Two other animals, which died after much longer illnesses, were: Calf 899, 9 to 10 months;

abomasum—90,000 Ostertagia; small intestine—18,000 mature and 18,000 immature adult *C. oncophora*, and 4,000 *Trichostrongylus*. Calf 885, 11 months; abomasum—42,000 Ostertagia; small intestine—7,000 adult and 25,000 immature adult *C. oncophora*.

Faecal Egg Counts

(c) These proved so erratic that we soon abandoned them as a diagnostic aid, although continuing to perform them for their possible research value. It is true that some severe cases of disease had high total counts, for example 20,000, 13,000, and 10,880 eggs per gram (e.p.g.); but on the other hand one calf whose abomasum contained 150,000 Ostertagia had a total count of only 2,000 e.p.g., a figure exceeded in certain animals which were definitely not suffering from worm disease. Total counts of less than 2,000 e.p.g. were common in severe cases, the lowest figure being 80 e.p.g. Accuracy was not improved when the eggs were indentified as to genus by hatching them and counting the different types of larvae for instance we recorded Ostertagia egg counts as high as 1,936, 1,640 and 1,040 e.p.g. in calves which did not have the disease or had it only in mild form, and as low as 480, 270 and 270 in 3 severe cases. It was difficult to make a good larval culture of watery faeces, and we had many failures despite considerable previous experience of this technique. The greatest defect of egg counts as a diagnostic aid was that the calf was likely to die during the week needed for the larval culture.

One of the veterinary surgeons in the district is of the opinion that he had seen cases of the same disease in previous years, but because of low egg counts had looked on them as other than worm disease. Our experience in this epidemic cannot be reconciled with the conclusion of Riek and Keith (1958) that " . . . an accurate assessment of the anthelmintic efficiency could be based on faecal egg counts taken at weekly intervals for two weeks before treatment and one week after treatment . . . " in the study of " Neguvon " which they carried out in Queensland under conditions of light infection (at least with Ostertagia).

Treatment

The calves on property "B" can be considered to exemplify our experience. They were Australian Illawarra Shorthorns, 6 to 9 months old, in good condition and well cared for. At the first sign of illness the calf was brought into a stall and individually nursed; treatment included intestinal sulphonamides, 2 doses of 30 grammes of phenothiazine (equivalent to 330 to 220 mg. per k., *i.e.* 15 to 10 g. per 100 lb., at 200 to 300 lb. liveweight), 42 grammes of piperazine adipate (460 to 310 mg. of salt per kilogramme, *i.e.* 21 to 14 g. per 100 lb.), astringents, " invalid feeding," gastric sedatives, antibiotics, vitamins and intravenous infusions of glucose saline. At best these measures were followed by temporary improvement.

Treatment with " Neguvon " was instituted, using an emulsion " Dipterex " of 62.5 per cent. w/v. The measured dose was mixed with about 4 times its own volume of water for convenience of administration. By mistake the first 3 calves, all severe cases, were given only 69 mg. per k., an inadequate dose as clearly shown by the lack of improvement in the clinical condition; at least this mistake helped establish the lower limit of effective dose rate. Succeeding cases were treated at the rate of 110 mg. per k., with results that can only be described as dramatic; the diarrhoea, hitherto intractable, ceased overnight, appetite reappeared within 24 hours, and life and strength commenced to flow back into animals which had been desperately ill. There were no relapses, and improvement continued steadily, though naturally the great loss of flesh was not replaced in a short time. These excellent results continued to follow the treatment, at dose rates down to 80 mg. per k., of some hundreds of calves, some of them practically moribund at the time of dosing. We could detect no advantage in increasing the dose rate to as high as 140 mg. per k.

Poisoning

Most calves were dull and off their feed for 4 to 8 hours after dosing, but were eating again next morning. Signs of more serious poisoning were quite common, but completely unpredictable; within our conditions we could detect no relation to dose rate, age, bodily condition, premedication, sex or feed. Table I shows the incidence in the 48 animals which were closely observed for at least 1 hour after dosing.

TABLE I
POISONING WITH " NEGUVON "

Dose—mg. per k.	Number of animals	Toxic Reactions			
		Fatal	Severe	Mild	None
140	4	0	0	0	4
110	9	0	9*	0	0
100	16	1†	1	1	13
90	3	0	2	0	1
80	12	0	6	0	6
Less than 80	4	0	0	0	4

NOTE.—* Two were given atropine, and responded.
† Despite atropine.

Poisoning when it occurred was of rapid onset and brief duration. The earliest time of appearance of definite symptoms was 30 minutes, and the latest 55 minutes, though occasionally a vague uneasiness was present as early as 10 minutes. The attack began with a tenseness of the abdominal muscles, apparently heralding a commencing colic, and usually accompanied by slight salivation and urination, and by contraction of the pupil. This either passed off soon, or developed into a severe colic, accompanied by bellowing and kicking, with respiratory difficulty and inability to stand, the animal going down and the rumen becoming tympanitic.

Animals showing such severe symptoms seemed to be in a dangerous condition, but if we deliberately left them alone they recovered spontaneously within

2 to 4 hours from dosing. We treated a few calves with atropine sulphate, by slow intravenous injection of 8 mg., and found that it gave complete relief in 1 to 2 minutes, except in one calf only. The latter, weighing 83 lb., was 1 of 4 similar calves given "Neguvon" at 100 mg. per k. At 10 minutes it showed abdominal discomfort, and at 30 minutes began to salivate, and then collapsed suddenly with difficult breathing. Atropine was given intravenously, but the animal died within 2 minutes. The other 3 animals were not affected.

From what we know now of the calf's tolerance to atropine we think a larger dose could have been used, and we would not hesitate to use 16 mg. or even more, and to inject it quickly in the rare severe form of "Neguvon" poisoning.

This giving of atropine after some 30 to 60 minutes did not affect the efficiency of the anthelmintic, as judged by clinical responses. However, it is economically impossible to allow an hour's waiting time on every farm, particularly during a serious epidemic, and we therefore adopted the general practice of dosing those calves which required it, and advising the farmer not to look at them for the next 2 hours.

We did not attempt to study the effect of giving atropine prophylactically, either with the anthelmintic or a little later. A very large number of animals would have been needed in view of the erratic incidence of poisoning.

Immunity

Treatment with "Neguvon" did not interfere with acquisition of the immunity which is so characteristic of nematode infections of cattle (Roberts, O'Sullivan & Riek, 1952). We had a number of instances of calves, successfully treated a few days before, continuing to thrive when put into a herd in which new severe cases occurred for some weeks afterwards.

Discussion

Genesis of the Epidemic

The timing of the outbreaks, the ages of the animals affected, and the finding *post mortem* of large numbers of Ostertagia of a uniform stage of development, suggested strongly that an overwhelming number of Ostertagia larvae had been picked up in a short time by calves which possessed inadequate immunity. It was striking that the only animals affected were those born after August, 1957, that is after the onset of the dry weather, when presumably larvae ceased to be abundant. In the absence of actual measurements, however, we will not attempt a theoretical explanation.

Causal Agent of the Epidemic

We concluded, from *post-mortem* examinations and to a certain extent from the pattern of faecal egg counts, that the prime cause of the disease was *Ostertagia ostertagi*, and that *Cooperia oncophora* appeared on the scene later and was of little importance; in fact this Cooperia seems to be of low pathogenicity—*e.g.* a calf from a herd where the trouble was not worm disease but faulty feeding had a total of 85,000 *C. oncophora* (and only 8,000 Ostertagia). From our experiences in this epidemic we hazard an estimate of 50,000 to 80,000 Ostertagia as the minimum number likely to be associated with serious disease in a calf 6 to 9 months old; and a smaller figure, say 10,000 to 12,000 for calves 1 month old.

Assessment of the Drug

To assess the efficacy of a drug by its performance in the field, without a full complement of formal controls, is difficult. We are well aware of this, and have accordingly subjected our own results to severe criticism before accepting them. A number of factors have operated to confirm our confidence in the drug; these are:—

(a) Once the disease was evident, it followed a reasonably well predictable course in the absence of treatment. This course was abruptly reversed by "Neguvon."

(b) On some farms we were allowed to treat only those calves which seemed certain to die, or we were called in for the first time when calves had reached this state. Not only were we able to bring the animal back from imminent death, but we were able to watch the disease progressing to the same state in untreated calves, which, in effect, were controls.

(c) All of 4 veterinarians independently using the drug in the district reported similar dramatic results in the treatment of a total of several hundred cases.

(d) While deprecating the routine use of egg counts for diagnosis of worm disease and for assessing anthelmintics, we derive supporting evidence from a few severe cases, with sustained high egg counts that fell to low figures after successful treatment, and remained low for long enough to exclude any mere temporary depression of egg production. This fall was not seen when treatment was inadequate, *e.g.* in 3 severe cases given 69 mg. per k.

(e) The drug has given good results in the field in selected cases among the succeeding crop of calves, also in artifical infections (Banks & Michel, 1959).

The Disease and the Drug in Another Year

This unusual epidemic occurred in an unusual year, and we do not wish to give the impression that Ostertagia infection regularly causes serious disease in calves in this district. Our preliminary studies (unpublished) in 2 previous years did not produce evidence of this, though we may have relied too much on faecal egg counts to indicate the presence of disease, during those studies.

Since the 1958 epidemic we have seen a good number of sporadic infections, but no epidemic. "Neguvon" has held its place in the armamentarium of drugs; in skilled hands its occasional toxicity is more than counterbalanced by its unique anthelmintic properties, especially against severe infections, but it is not suitable for lay use.

Acknowledgments.—We wish to thank Mr. A.

(*Concluded at foot of col.* 1, *page* 245)

Enzymatic Zonulolysis as an Aid to Cataract Surgery in the Dog

BY

F. G. STARTUP
Worthing

CATARACT surgery in the dog has been practised now for many years, but interest in ophthalmic surgery in this species has increased greatly in the past decade. This is due, in part, to an overall increase in small-animal practice; and partly due to the development of new techniques.

This preliminary report describes a method of non-traumatic detachment of the crystalline lens, using the selective action of an enzyme upon the zonule or suspensory ligament.

Extracapsular and Intracapsular Extraction

In the surgery of senile cataracts, the lens may be removed by either extracapsular or intracapsular methods of extraction. In extracapsular lens extraction the anterior lens capsule is opened and the lens is expressed through this opening, removing the nucleus and as much of the cortex as possible, but leaving the thin posterior capsule intact. In intracapsular lens extraction, the lens is removed intact in its capsule, after rupturing the suspensory ligament that holds the lens in position. The lens is extracted either by forceps applied to the capsule; by an erisiphake, an instrument applied to the anterior lens capsule through which suction is made mechanically; or by pressure applied to the outside of the globe by a lens expressor.

The advantages of the extracapsular operation are threefold. First, less skill in the manipulation of the lens is required than in the intracapsular method; secondly, as the posterior lens capsule is left intact, there is less risk of vitreous loss; and, thirdly, as the zonule is left intact, the operation is less traumatic, and there is less risk of damage to the iris and ciliary body. There are, however, disadvantages in this method, such as irido-capsular synechiae formation, secondary cataract, iridocyclitis due to irritation from lens fragments left in the anterior chamber, and, very often, a poorer visual result.

The intracapsular method will avoid these complications, the ideal being to extract the lens with its capsule intact, and, if possible, leaving the hyaloid membrane intact and thereby avoiding vitreous loss. Such an extraction necessitates the detachment of the lens from the zonule, and this is accomplished with the help of forceps and vectis. The zonular fibres are often very resistant, particularly in the younger animal, and the use of these instruments, and the push-and-pull manoeuvres that have to be employed, may result in rupture of the anterior lens capsule, iridocyclitic injuries and subsequent haemorrhage from the iris, loss of vitreous due to rupture of the hyaloid membrane, and, possibly, retinal detachment due to excessive traction.

Enzymatic zonulolysis enables the intracapsular method of extraction to be employed without the necessity of mechanical zonulotomy and its inherent disadvantages.

History

The technique of enzymatic zonulolysis was first described by Dr. J. Barraquer of Barcelona in 1958 and subsequently confirmed in this country by Mr. J. E. H. Cogan. Investigations had been directed for some time towards the possibility of zonulotomy by chemical means. As a result, the lytic action on the lens zonule, of the proteolytic enzyme, alpha-chymotrypsin, was discovered. Alpha-chymotrypsin is an endopeptidase, having fibrinolytic and proteolytic action similar to trypsin, but differing in its action and having its own specificity.

This enzyme has a selective action on the lens zonule and, when injected into the anterior chamber, causes subluxation of the lens within a few minutes of irrigation. Despite its action on the zonule, the enzyme appears to have no adverse effect on the other intra-ocular structures.

Alpha-chymotrypsin

Alpha-chymotrypsin is obtained from its inactive precursor, alpha-chymotrypsinogen, which is extracted from the bovine pancreas. It is purified by crystallisation and is supplied in sterile, freeze-dried packs. It will remain stable in a dry form, but will rapidly lose its activity when in solution. Solutions must be freshly prepared just prior to use, and it is important that all syringes and instruments used

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Acute *Ostertagia ostertagi* Infection in Young Cattle. —*Concluded.*

Korthals, of the Institute of Medical and Veterinary Science, for invaluable assistance in both field and laboratory; Mr. C. Hambrook, of Wm. Cooper and Nephews (Australia) Pty. Ltd., for supplies of piperazine adipate for trial; Messrs. Henry H. York and Co. Pty. Ltd., for generous supplies of "Neguvon."

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are free from alcohol or other chemicals likely to inactivate the enzyme. It is recommended that all-glass syringes be used, and any contact between the solution and metallic surfaces be kept to the minimum.

The enzyme is dissolved for use in sterile, normal saline, and is available in ampoules each containing 1 mg. of alpha-chymotrypsin.* The addition of 0.5 ml. of saline diluent will provide 0.5 ml. of a 1 in 500 solution. This is the concentration required for this technique in the dog, and generally the entire 0.5 ml. of solution is utilised.

Operation Technique

1. A corneal or corneoscleral conjunctival incision is made in the usual way.
2. The contents of one ampoule of alpha-chymotrypsin (1 mg. in 0.5 ml. saline) are now slowly injected, using a lachrymal needle, carefully inserted beneath the iris, between the iris and the lens, so that all parts of the periphery of the anterior chamber are thoroughly flooded with the solution. Zonulolysis takes 3 to 4 minutes.
3. After 4 minutes, the alpha-chymotrypsin solution is washed away by irrigation of the anterior chamber and subiritic angles with saline.
4. The lens is now subluxated or lying free, the suspensory ligament having been digested by the enzyme.
5. The lens is removed, either by the use of capsule forceps, or by the erisiphake technique, or by the expression technique using a lens expressor.
6. The wound is now closed and the operation completed in the usual way.

Discussion

The use of this technique in the dog allows intracapsular extraction with the minimum of traction and with the minimum of intra-ocular instrumentation, and is an important advance in the surgery of cataracts.

The concentration of alpha-chymotrypsin used in human ophthalmic surgery is 1 in 5,000, and this concentration will produce luxation of the lens within three minutes. Such a concentration will not produce any apparent digestion of the zonule in the dog, and, although successful results have been obtained with a concentration of 1 in 1,000 in some cases, consistent favourable results have only been obtained with a concentration of 1 in 500. This would appear to be due to structural or chemical differences in the zonule of different species.

Despite the high concentration of alpha-chymotrypsin used, the post-operative course has been completely normal, and no post-operative complications that could be attributed to the use of this enzyme have been noticed. In the human subject, this enzyme technique produces no alteration in the cornea, iris, hyaloid, or retina; and Barraquer, in his original report, states that concentrations of between 1:500 and 1:2,000, used in the rabbit, produced neither inflammatory or degenerative changes in the intra-ocular structures.

The study of other aspects of cataract surgery in the dog is necessary in order to obtain consistent satisfactory results, but this technique will remove some of the hazards associated with intracapsular extractions.

Acknowledgment.—Acknowledgment is due to S. Maw Son & Sons Ltd. who have made supplies of alpha-chymotrypsin available for clinical trial.

* "Zonulolysin" (S. Maw Son & Sons Ltd.).

(*Continued at foot of adjoining column*)

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Current Literature

REPORT

Annual Report of the Department of Veterinary Services and Animal Industry, Nyasaland, 1958.

In Nyasaland, as in many other tropical countries where diets are low in protein, an expanding cattle population is of great importance to feed the constantly growing human population. It is encouraging to note, then, that over the past 5 years, and in spite of ever-increasing slaughter demands on it, the country's cattle population has increased by about 25 per cent. This has been achieved by greater tick control and by improvements in animal husbandry methods, matters for which the Veterinary Department can justifiably claim most credit.

In 1958 the cattle census was 343,000; all except about 4 per cent. belonging to the relatively few Europeans and Asians in the country are owned by Africans. In addition there were 413,000 goats, 62,000 sheep and 82,000 pigs, virtually all of them belonging to Africans. There were, however, signs of a greater interest in stock by Europeans.

Animal Health.

Although tick-borne diseases, of which East Coast fever was the most important, continued to be the cause of greatest economic loss it was rabies that most caught the public eye and caused the most concern to the Department.

Action is being taken against tick-borne diseases by extending dipping facilities in the territory, mainly in the Northern Province. Good progress was made in implementing the Colonial Development and Welfare Scheme for this and by the end of the year 27 of the 40 prefabricated dipping tanks to be installed under the scheme had been completed. This project appears to have won the co-operation of the local cattle owners and by the year's end an average of over 1,300 cattle a week was being dipped in the tanks in use.

Besides their primary function as disease control centres these tanks are proving useful contact points from which to carry the Department's extension work on animal husbandry into the neighbourhood once the stockowners' confidence has been gained by tick control, and their interest aroused.

Although East Coast fever was the most important tick-borne disease, heartwater can sometimes be more devastating for individual owners particularly if peracute cases occur among high yielding dairy animals. Like East Coast fever it is most prevalent during the wet months. Many cases of piroplasmosis, the occurrence of which invariably indicates a breakdown of tick control, were treated. A suspected case of malignant gonderiosis (*G. bovis* infection) was seen for the first time in Nyasaland.

Trypanosomiasis occurred in the known fly belts, particularly in the Northern Province; dimidium bromide treatment was successful. *T. vivax*, *T. brucei* and *T. theileri* are the trypanosomes generally occurring but in one area a trypanosome of the *Congolense* group appears to be responsible, at any rate partially, for hindering the full development of the area for stock.

Bovine tuberculosis occurs mainly in the Northern Province; in one slaughterhouse condemnations for it were approximately 5 per cent.

Rabies was prevalent, 75 cases being confirmed; many others probably went undetected. Although dogs were mainly affected the disease was seen also in cats, cattle, sheep, a goat and a donkey.

A determined attack on the disease was made by mass vaccination of dogs, particularly in rural areas, strongly supported by the destruction of unvaccinated strays. A special Rabies Control Unit, with vehicles provided from Colonial Development and Welfare funds, was responsible for the campaign, and by the year's end some 20,000 dogs had been vaccinated and 14,000 destroyed.

The Report does not indicate whether nerve tissue or chick embryo vaccine was used, nor is it clear how, if as is stated vaccination is voluntary, dogs not identifiable as having been vaccinated can be legally destroyed. By the end of the year the campaign seemed to be having its effect and there are good hopes that this policy of tackling the disease "with a syringe in one hand and a gun in the other" will eventually eradicate it.

A common cause of considerable economic loss in livestock was chronic helminthiasis; a list is given of the parasites indentified during the year. Newcastle disease in poultry was prevalent.

The Central Laboratory at Blantyre was concerned mainly with the examination of field specimens, the purchase and issue of vaccines and the training of some veterinary assistants.

Animal husbandry and livestock improvement.

The schemes initiated in previous years for stock improvement were continued. They are directed mainly towards improving accommodation and paddocks for stock, conserving fodder and improving grazing areas, and inculcating elementary principles of husbandry.

At the three Livestock Improvement Centres exotic (Friesian and Jersey) and indigenous (Angoni and Nyasa Zebu) cattle were kept, and from them improved stock was supplied to African and European farmers. The Poultry Centre at Mikolongwe, which had an average of nearly 700 birds in lay during the year, almost trebled its output of birds (30,255) for sale.

It is obvious from the Report that the Department is making a very real and valuable contribution to the welfare of the territory. At the same time the Director, Mr. D. E. Faulkner, makes a pertinent comment when he says that "emphasis must again be placed on the importance of a closer integration of livestock into the farming system if the livestock industry is to play its full and vital part in the economy of the country. While much can be done to conserve, and possibly increase and improve, the livestock population, the fundamental problem remains in many areas of how to arrest what appears to be the gradual squeezing of livestock off the land owing to the increasing cultivation and fragmentation of 'gardens' by the rapidly expanding human population." W. E. L.

ABSTRACTS

The Correction of Cobalt or Vitamin B_{12} Deficiency in Cattle by Cobalt Pellet Therapy. SKERMAN, K. D.; SUTHERLAND, A. K.; O'HALLORAN, M. W.; BOURKE, J. M., and MUNDAY, B. L. (1959). *Amer. J. Vet. Res.* **20.** 977.

Cobalt bullets maintained an adequate concentration of cobalt in the rumenal fluid of cattle as judged by weight gains and concentration of vitamin B_{12} in the liver.

Calves less than 6 weeks old did not retain the bullets satisfactorily. Lactating cows also did not always retain the bullets.

Coating with calcium phosphate did not occur in any of the 70 bullets recovered from experimental cattle. G. B. S. H.

The Effect of Chemotherapy on the Numbers of *Bacterium coli* in the Faeces of Calves. WILLIAMS SMITH, H., and CRABB, W. E. (1960). *J. comp. Path.* **70.** 126.

Since large numbers of *B. coli* are present in the faeces of healthy, as well as scouring calves, the effect of administering different antibiotics on the numbers of these bacteria in the faeces of healthy calves was studied, in the hope that it may throw some light on the chemotherapy of calf scours.

Bactericidal drugs such as streptomycin, neomycin and polymixin had the greatest effect in depressing the *B. coli* faecal count when given as a single dose by mouth. Bacteriostatic drugs, *e.g.* terramycin, aureomycin and the sulphonamides had a less marked effect. These bacteriostatic drugs, however, had a much greater effect when given in multiple dosage. A much greater and more prolonged reduction in the *B. coli* faecal count was obtained when streptomycin was given orally than when it was given subcutaneously.

Some of the experiments were nullified by the fact that *B. coli* resistant to the antibiotic under study emerged in the faeces during the treatment period. Change from an almost completely sensitive *B. coli* faecal flora to a resistant one as a result of administering only 1 or 2 oral doses often occurred within 24 hours. H. W. S.

The B.S.A.V.A. Third Annual Congress

Over 350 people registered at the Third Annual Congress of the British Small Animal Veterinary Association held in London last week-end. This was a record attendance for the Association, and was no doubt due to the special appeal of the colour television section of the programme. Nearly 100 new members who joined during the Congress have now put the total membership up to approximately 550.

At the Annual General Meeting held on the Sunday morning, Mr. S. F. J. Hodgman handed over the Presidential office to Mr. W. B. Singleton who has acted as Honorary Secretary of the Association since its foundation over 3 years ago. In performing this ceremony, Mr. Hodgman referred to the tremendous amount of work done by Mr. Singleton on behalf of the Association and to the great pleasure they took from the fact that Mr. Singleton would be visiting the United States shortly to lecture and to represent the Association at the Annual Conference of the American Animal Hospital Association. Mr. Hodgman was elected senior Vice-President and Mr. Alasdair Steele-Bodger was elected junior Vice-President. Other appointments were, Honorary Secretary, Mr. G. N. Henderson; Assistant Secretary, Mr. A. P. Phillips; Honorary Treasurer, Mr. J. S. J. Lauder. This will be Mr. Lauder's second year as Treasurer, and Mr. Hodgman referred to the excellent way in which the accounts of the Association had been handled and to the healthy state of its finances.

Mr. Hodgman made two major speeches during the Congress, the first at the opening ceremony on the Friday morning and the second in his Presidential address to the Annual General Meeting. In his opening address, Mr. Hodgman referred to the problem of welfare clinics; he deplored the practice of people well able to afford veterinary fees taking their pets into welfare clinics, and thereby " stealing " the money that charitable people had subscribed, often at real personal sacrifice, for the service of the poor. He suggested that if the profession and the clinics were to co-operate together for the benefit of pet animals, it was important that the clinics should agree to confine their services to the animals of poor people only. The President also referred to the continued failure of local authorities to implement existing legislation providing for the adequate inspection of pet shops. He suggested that many pet shops are in a deplorable condition, and that those responsible take no steps to remedy matters, although they are empowered to insist on adequate inspection. Turning to the subject of boarding kennels, Mr. Hodgman referred to the present unsatisfactory state of affairs whereby animals are confined to kennels during holiday periods while owners cheerfully pay ridiculously low charges without relating them to the inadequate standards of accommodation and feeding which inevitably follow. He suggested that it was high time that some measure of control was exercised by licensing boarding kennels and making them subject to veterinary inspection; this would mean that animal owners would have to be prepared to pay a reasonable price for boarding their pets.

In his Presidential address at the Annual General Meeting, Mr. Hodgman expressed the thanks of all members to the many people who had been instrumental in ensuring the success of the Congress and, in particular, he mentioned Smith, Kline & French Laboratories Limited who had so generously contributed the television facilities. He also called for more local activity in certain areas of the country where, despite the number of members, few if any meetings had been held; he invited anyone prepared to take an active part in organising meetings in his locality to contact the Committee.

There was no doubt in the minds of the delegates that the two sessions of closed circuit colour television on Friday and Saturday afternoon provided the highlight of the scientific programme. Surgical procedures were demonstrated from the Beaumont Animal Hospital and these were discussed by a panel sitting in front of another camera in the Royal Veterinary College. It would be impossible to select any one procedure for special mention; every surgeon performed his operation with admirable precision, and the magnification which was made possible by the television technique allowed every facet of the procedure to be seen clearly. The picture of the operation was obtained by shooting the camera onto a mirror fixed over the operating table which, in turn, looked straight down onto the actual site; in this way the audience were able to see every phase in the progress of the operation. There were many comments from the viewers concerning the " professionalism " of those taking part, and it is to be hoped that the personalities concerned will not be lost to B.B.C. television producers ! Both sessions were televised without a single visible hitch and this was due in the main to the skill of the producer, Mr. Norman Manley-Cooper.

Among the papers given, that on cardiac disease by Dr. W. I. M. McIntyre was one of the most memorable. It was the perfect refresher course on heart conditions, and gave delegates the basic information which would be of continual help to them in day-to-day practice. Dr. Hall also impressed the audience with his paper on the use of tranquillising agents. He managed to bring a note of realism into a subject which has been the butt of a great deal of ill-informed criticism and a certain amount of Press hysteria. Again, on the practical side, the paper by the past President of the Association, Mr. C. E. Woodrow, reviewed the regulations covering the export of dogs to different countries of the world. It was obvious that the paper was presented after a considerable amount of work and the reading of a large number of documents. The substance of Mr. Woodrow's findings are ultimately to be published in a booklet form which will be made available to members of the profession. By mentioning 3 of the papers presented the impression may have been given that others were not of equal merit. In point of fact, every paper was obviously the result of a considerable amount of work by each of the speakers in ensuring

that his presentation would be of interest and value to listeners.

The trade exhibition, which was attended by 31 commercial companies, was housed in a larger room than last year and this allowed more space between the exhibits. In terms of size this was a small exhibition but it was obvious that a great deal of thought had gone into the planning of each stand, so that all the available space was carefully used. As usual, the attendance was high and all the exhibitors expressed pleasure at the enthusiasm shown by the veterinary visitors.

The Association was pleased to welcome some guests from the Continent, among them Professor Dr. Völker and Dr. Rodenbeck from Hanover, Dr. Westerman from Holland, Dr. Distave from Antwerp and Dr. Alloy from Le Havre. In addition, 4 American veterinarians from American bases in this country attended. It is hoped in future years to encourage more veterinary surgeons from the Continent to attend so that a direct exchange of ideas between colleagues from different countries may take place.

The social arrangements were a great success, particularly the dinner dance held at the Washington Hotel on the Saturday evening. The President's personal guests were Mr. S. L. Hignett (President of the British Veterinary Association), and Mrs. Hignett, Mr. J. A. Anderson (Professional Secretary of the B.V.A.) and Mrs. Anderson, Mr. W. G. R. Oates (Registrar of the R.C.V.S.) and Mrs. Oates, and Mr. R. H. McNabb of Smith, Kline & French. Mr. Hignett proposed the toast to the Association in a most entertaining manner and referred to the increasing influence that the B.S.A.V.A. representatives were having on the B.V.A. Council. In fact, Mr. Hignett said that occasionally when a particularly full agenda had to be completed, he had especially noticed the tenacious way in which the B.S.A.V.A. representatives had stated their views. In reply, Mr. Hodgman said how pleased he was to welcome his guests and expressed the Association's regrets that Mr. F. Knight (General Secretary of the B.V.A.) had been prevented from attending at the last minute. A particularly pleasant touch was provided by the provision of posies for all the ladies present as a personal gift from the President, and Mrs. Hazel Phillips, Chairman of the Ladies' Social Committee, presented bouquets to the President's lady guests. At about midnight, an international slow bicycle race was held on the dance floor with 4 members representing their respective countries: the event was won by Scotland.

The ladies' functions included a visit to the salon of Norman Hartnell and those who were fortunate enough to see the delightful group of wives who set off for this event might have been excused from wondering who were the models and who were the wives, so elegantly were they turned out! The flower demonstration in the afternoon was a great success and the flower arrangements were displayed in the hotel lounge during the reception before the dance on the Saturday evening. The other two events organised by the Ladies' Social Committee were the visits to the Design Centre and the Tea Centre and the special meeting of the V.V.B.F. on the Sunday morning. The Committee are to be congratulated on the success of their arrangements.

A Press Reception was held on the Friday and this was particularly well supported; the new President, Mr. Singleton, recorded an interview for B.B.C. Radio Newsreel which was heard at about 7.20 on the same evening. In this broadcast he mentioned in particular the increasing use made by the public of the veterinary surgeon in private practice and drew attention to the high standard of care now available to pet animals; the veterinary surgeon in small animal practice had come to be regarded by pet owners as the "family doctor" for the pet, maintaining its health throughout its life. In addition to this, reference was made to the Congress by Dr. Boltz in his science news progamme on Friday evening. Another personality from the television world who spent a great deal of time at the conference on Friday was Stanley Dangerfield of the "Good Companions" programme.

The Association has taken great encouragement from the success of this Congress, and the increasing confidence of the Executive Committee can be seen in its ambitious future plans. One major development is the production of a *Journal of Small Animal Practice* which it is hoped will succeed as an international quarterly on this subject. The first issue of this journal will be available early in April, and it is also hoped that the detailed proceedings of the Congress will be published in the near future.

G. N. H.

UFAW ANNUAL EASTER CONGRESS

The UFAW Easter Congress this year will be held at Saltley College, Birmingham, from Friday, April 8th, to Tuesday, April 12th.

The provisional programme includes a Symposium on "Humane Experimental Technique," and the speakers will be E. C. Appleby, PH.D., B.SC., M.R.C.V.S.; M. R. A. Chance, PH.D., D.SC.; Phyllis G. Croft, PH.D., M.R.C.V.S.; E. C. Grant, B.SC.; Major C. W. Hume, M.C., B.SC.; and J. H. Mackintosh, M.SC.

There will also be a visit to the Experimental Unit for Humane Technique.

Other lectures will deal with "Introducing Animal Welfare to Libya" (F. Jean Vinter, M.D.) and "Animal Welfare and Meat Production" (D. Norma Egginton, M.R.C.V.S.). A visit to a bacon factory will be arranged to see a demonstration of the carbon dioxide method of anaesthetising pigs before slaughter.

Fees (including full board, single bedroom, and all visits) will be £5 with a reduced fee for students at £2. Part-time visitors will be charged *pro rata*, and day visitors will be welcomed. All members of the profession and veterinary students are invited to attend whether or not they are actually members of UFAW.

Enquiries and bookings should be made to: UFAW (Easter Congress), 7a Lamb's Conduit Passage, London, W.C.1.

All bookings should be accompanied by a deposit of 10s.

News and Comment

FEES FOR THE VETERINARY EXAMINATION OF IMPORTED CATTLE, SHEEP, GOATS, AND PIGS

From April 1st, 1960, fees for the veterinary examination of imported cattle, sheep, goats, other ruminating animals, and swine which have to be kept in quarantine and tested for disease under veterinary supervision, will be increased.

Fees for the veterinary examination of animals which do not need to be placed in quarantine or tested for disease remain unchanged at 6d. per head for cattle and pedigree animals and at 2½d. for the rest.

The basic charge for each consignment kept in quarantine and tested for disease will in future be £15 and will include the cost of the first day of quarantine. There will, in addition, be a daily charge of £2 10s. for every subsequent day spent in quarantine. Both these charges apply irrespective of the number of animals in the consignment.

Very few importers will be affected by the increased charge as the majority of animals of these kinds do not need to be placed in quarantine or tested.

There were 9 consignments in 1957, 11 in 1958, and 2 in 1959.

Animals which can be proved to have gone into quarantine abroad or to be *en route* to Great Britain on April 1st will pay fees at the old rate.

ANDRE MAYER F.A.O. FELLOWSHIPS, 1960

The Food and Agriculture Organisation of the United Nations has announced that it will offer 10 or 12 André Mayer Fellowships in 1960.

These awards will be made under the following two groups:—

Research. For unusually promising persons with research experience behind them who would offer a guarantee for the carrying out of independent research work.

Research Training. For younger and promising individuals who have demonstrated an inclination towards and an aptitude for research work.

The subjects presented must be in relation to F.A.O.'s activities which comprise: land and water development, plant production and protection, animal production and health, rural institutions and services, fisheries, forestry and forest products, nutrition (non-medical), atomic energy in food and agriculture, agricultural economics (commodities, statistics, economic analysis).

Further information can be obtained from the Secretariat of the F.A.O. National Committee for the United Kingdom, Ministry of Agriculture, Fisheries and Food, Whitehall Place (East Block), London, S.W.1.

LORD WALDEGRAVE AT THE NATIONAL DAIRY HERDS ASSOCIATION LUNCHEON

Lord Waldegrave, Joint Parliamentary Secretary to the Ministry of Agriculture, Fisheries and Food, attended the luncheon given in London on Friday, March 18th, by the National Dairy Herds Association to present trophies to the successful competitors in the National Dairy Herds Competition held in 1959. In the course of his speech he said :—

Milk Recording

"I am sure that the Board is right in keeping us on our toes about milk composition, especially now that we are increasing our reliance on bulk feeds. Hay and silage, important as they are, are not of a consistently high standard and we are told that any marked fall in their nutrient content can soon play havoc if they are not carefully watched both with yields and with compositional quality.

"So we cannot afford to ignore our milk records, even if we do not go in for pedigree breeding, nor can we treat the monthly fat and solids-not-fat results from the dairy as being of little more than academic interest and tuck them behind the clock to await the next spring-clean.

Milk Hygiene

"On the milk hygiene front, we have made great strides over the last 10 years. When I look back on the standard of many farm dairy buildings just after the war—particularly those that were apparently built for anything but dairying—I am delighted at the progress made. I have even heard some of our modern parlours compared favourably with some catering establishments.

"But there are still up to 20 per cent. of dairy farms that are not complying with the Milk and Dairies Regulations in spite of the assistance available under the Farm Improvement Scheme and regardless of the 4d. a gallon more which the Milk Marketing Board pays for T.T. milk. The Ministry's milk officers are doing their utmost to advise and encourage them into making the grade and I would seriously suggest to these farmers that they should get busy both in their own interest and the national interest."

FRIESIAN SOCIETY'S PROTEST AT "RECKLESS EXPERIMENT"

A protest against the Milk Marketing Board's plan to use only progeny-tested bulls at their artificial insemination centres was made in London by Mr. W. H. Bursby, secretary of the British Friesian Cattle Society, who condemned the policy as "a reckless theoretical experiment with the nation's cattle."

He said the proposed method of selecting the bulls was wrong and the proposed intensive use of the bulls was wrong. "Artificial insemination is a service to breeding, but the Board, with their near-monopoly of A.I. centres, no longer wish to regard it as a service but as a way of dictating policy to two-thirds of the national dairy herd."

Mr. Bursby said the proposed criteria for selection of proven bulls would not guarantee all-round improvement of the breed. The "contemporary comparison" method of evaluation on production had only once been considered by a joint committee of

scientists and breeders and they decided against rating bulls on this basis.

The council of the society were unanimous that great danger and damage would result from the too early use of proven bulls. Most important of all, by restricting the size of the stud, the build-up of common blood both by design and accident would be such as to frighten any practical experienced breeder. Throughout the scheme the too few bloodlines would become still fewer.

Dr. Joseph Edwards, scientific adviser to the Milk Marketing Board and head of the production division, is reported as having said that in his view the extended use of known bulls was a logical development of A.I. and did not need consultation with individual breed societies.

THE REGISTER OF VETERINARY SURGEONS

Mr. Ian Howie Hart, B.V.SC. (SYDNEY), c/o Overseas Visitors Club, 180 Earls Court Road, London, S.W.5, was admitted to the Commonwealth List of the Register on March 15th, 1960.

DR. J. C. BROOM, O.B.E., M.D.

Miss Joan O. Joshua writes:—

The news that Dr. Broom had died suddenly after a short illness came as a great shock. Although he was not a member of the veterinary profession, Dr. Broom had come to seem like one of ourselves, so closely had he been connected with leptospirosis in animals. He was, of course, a distinguished research bacteriologist in the Wellcome Laboratories of Tropical Medicine and had earned world renown for his work on leptospirosis, both human and animal.

A man of quiet, almost shy charm with an unassuming and modest manner of approach, he was yet so clearly a master in his own field that none could doubt they were meeting a real authority on his chosen subject. Fortunately, in addition to numerous papers—many in collaboration with other workers—he has left a valuable summary of his work in his book "Leptospirosis," written jointly by himself and his friend Dr. Alston. His willingness to collaborate with anyone seeking his assistance was typical of his generosity with his knowledge.

I myself was privileged to work with him in a minor rôle on canine leptospirosis and shall ever be grateful for his patience, kindness, and inspiration. Well do I recall late evenings spent investigating certain jaundice cases in cats which both he and I felt should be of leptospiral origin but which we had eventually to admit we could not confirm. For many years practising veterinary surgeons relied upon Dr. Broom for diagnosis of leptospirosis in the dog, until the burden of this task threatened to overwhelm him.

Although I did not see him frequently of recent years the feeling that his ever-ready help and advice were available whenever one chose to ask was most comforting. His passing leaves a sense of sadness difficult to convey to those who have not shared with myself and many other veterinarians the pleasure and privilege of his friendly and charming acquaintance.

UNIVERSITY NEWS

Liverpool

March, 1960

Faculty of Veterinary Science, Degree of B.V.Sc.

First Examination, Part IV (Zoology)

Bairds, J. M.; Byrne, D. J.; Charnock, M.; Chew, P.; Clement, J. E.; Cross, Janet A. H.; Davies, J. A.; Dolan, M. S.; Duckworth, R. H.; Edginton, A. B.; Evans, M. H. D.; Fox, R. I.; Frith, Margaret; Gough, P. J.; Hennessey, Marie C.; Holness, Sheila; Jones, D. E.; Lawson, J. B.; Lee, R.; Mann, J. A.; Metcalfe, D. T.; Price, D. L.; Stocks, A. G. H.; Thomas, G. J. S.; Topping, A. R.; Wade, A. J.

Second Examination, Part I

Hammonds, Patricia; Rawson, B. C.; Strong, M. G.

Second Examination, Part II

Aldridge, Margaret C.; Davies, G. E. G.; Jones, R. T.; Riffkin, G. G.; Williams, M. H.

Bristol

The following students passed the Second Examination for the degree of B.V.Sc. (Section I) (Anatomy, Pharmacology, Physiology):—

Baker, G. J.; Bowerman, H. R. L.; Davies, K. A.; Dunford, S. J.; Foster, S. J.; Garratt, R. C.; Gregory, D. C.; Griffin, R. B.; Johnston, R. S.; Kelly, A. M.; Ratcliff, J. A.; Sharpe, W.; Shillabeer, E. H.; Stephens, D. B. (with Distinction in Anatomy and in Pharmacology), Stephens, D. E.; Taylor, Miss J. K.; Wilsmore, A. J.

The following students passed the Final Examination for the degree of B.V.Sc. (Section I) (Public Health):—

Anstey, Miss J. M.; Farman, R. S.; Gregory, M. W.

PERSONAL

Births

HOPKINS.—On March 11th, 1960, at Tiverton, Devon, to Gillian, wife of Alan R. Hopkins, B.VET.MED., M.R.C.V.S., a son, Kenneth John.

JAMES.—To Joan, wife of Terry James, M.R.C.V.S., Roch Cottage, Newtown, on February 16th, 1960, a son, Andrew Kevin, a brother for Nigel and Garry.

McVOY.—On March 11th, 1960, to Shirley, wife of Kim McVoy, M.R.C.V.S., of "Croft Bungalow," Ewhurst, Surrey, a son, Richard William, brother for Alistair.

SEWELL.—On March 10th, 1960, at The Plateau Hospital, Jos, Northern Nigeria, to Cynthia, wife of Morley Sewell, M.A., VET.M.B., M.R.C.V.S., the gift of a daughter, Ruth Miriam, sister for Marybeth.

WOOD.—On March 12th, 1960, to Patricia, wife of Keith Wood, B.SC., M.R.C.V.S., a daughter, Catherine.

COMING EVENTS

March

29th, 30th and 31st (Tues., Wed. and Thurs). Annual Conference of the A.V.T. & R.W. in Wills Hall, Parrys Lane, Stoke Poges, Bristol.

30th (Wed.). Joint Meeting of the Lincolnshire and District Division with the Society of Practising Veterinary Surgeons at the Great Northern Hotel, High Street, Lincoln, 2 p.m.

April

1st (Fri.). Informal Dinner of the North of Ireland Veterinary Association at the Grand Central Hotel, Belfast, 7.30 p.m.

2nd (Sat.). 14th Annual Dinner of the B.R.X. Club at the Royal Veterinary College, London, N.W.1, 6 p.m.

4th (Mon.). Meeting of the East Yorkshire Clinical Club at the Talbot Hotel, Malton, 8 p.m.

6th (Wed.). Spring Meeting of the North of Scotland Division in the Northern Hotel, Aberdeen, 2.30 p.m.

7th (Thurs.). 12th Meeting of the British Veterinary Poultry Association at the Royal Veterinary College, Camden Town, N.W.1, 11 a.m.

8th (Fri.). Meeting of the Midland Counties Veterinary Association at the Abbey Hotel, Great Malvern, Worcs., 2.30 p.m.

Annual Buffet and Dance of the Yorkshire Veterinary Society at the Parlaway Hotel, Otley Road, Leeds, 8 p.m.

9th (Sat.). Symposium of the Forensic Science Society at Guy's Hospital Medical School.

12th (Tues.). All-day Meeting of the Central Veterinary Society at the Royal Veterinary College Field Station, North Mimms, preceded by luncheon at the Brookman's Park Hotel, Hatfield, 12.30 p.m.

13th (Wed.). Meeting of the Sussex Veterinary Society at the Old Ship Hotel, Brighton, 2.30 p.m.

20th (Wed.). Meeting of the Southern Counties Veterinary Society at the Royal Hotel, Winchester, 7.30 p.m.

Meeting of the Section of Comparative Medicine at the Royal Society of Medicine, 5 p.m.

30th (Sat.). Meeting of the N.W. Region of the B.S.A.V.A. at the Queen's Hotel, Manchester, 7.30 p.m.

Dinner and Dance of the Central Veterinary Society at the Fellows Restaurant of the Zoological Society, Regent's Park, N.W.1, 7 p.m.

May

6th (Fri.). Annual Dinner of R.V.C.A. at the Royal Veterinary College, Camden Town, N.W.1, 6.30 p.m.

August 28th to September 3rd. 78th Annual Congress of the British Veterinary Association in Glasgow.

B.V.A. COMMITTEE AND COUNCIL MEETINGS IN EDINBURGH

Tuesday, April 19th

Late Evening. Finance Sub-Committee.

Wednesday, April 20th

10 a.m. Small Animals Committee.

12 noon. Home Appointments Committee.

2.15 p.m. Veterinary State Medicine Committee.

4 p.m. Parliamentary and Public Relations Committee.

Thursday, April 21st

10.30 a.m. Farm Livestock Committee.

2 p.m. General Purposes and Finance Committee.

Friday, April 22nd

10.15 a.m. Council Meeting.

ADDRESSES OF DISEASE INFECTED PREMISES

The list given below indicates, first the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax

Aberdeen. Turriff Knackery, Turriff; Thomastown, Auchterless, Turriff (Mar. 17).

Argyll. Kilblaan Farm, Southend, Campbeltown (Mar. 18).

Dumfries. Knowe Farm, Kirkconnel, Sanquhar (Mar. 15).

Perth. Whistlebrae Farm, Braco, Dunblane (Mar. 21).

Salop. Fields Farm, Alkington, Whitchurch (Mar. 17).

Somerset. Almonry Farm, Muchelney, Langport (Mar. 15).

Fowl Pest

Berks. Windyridge Poultry Farm, 263, Barkham Road, Wokingham; 78, Bearwood Road, Wokingham (Mar. 15); 3, Spring Gardens, Finchampstead (Mar. 19); Halford Cottage, Edneys Hill, Wokingham (Mar. 21).

Essex. Mitchells Farm, Stapleford Abbots (Mar. 18).

Hants. Crossway, Middle Wallop, Stockbridge (Mar. 15); Arford Farm, Headley Bordon (Mar. 18).

Herts. The Cedars, Turnford (Mar. 21).

Hunts. Mill Lane Premises, Hemingford Grey (Mar. 16).

Kent. South Mockham Farm, Reynolds Lane, Tunbridge Wells (Mar. 17); Penny Pot Farm, Hythe (Mar. 18).

Leics. Copper Beeches, Woodside Road, Oadby (Mar. 15).

Lincs. 31, West Street, Horncastle (Mar. 16).

Norfolk. 8, Council Houses, Bawdeswell, E. Dereham (Mar. 16); Leys Farm, Attleborough (Mar. 20).

Staffs. Field View, Whitley Eaves, Eccleshall (Mar. 18).

Suffolk. Thatched Cottage, Elmswell, Bury St. Edmunds; School House, Elmswell (Mar. 19).

Surrey. Warblers Green, Water Lane, Cobham; Holding, Junction of Rectory Road, and Sugdon Road, Thames Ditton; Downside Farm, Downside Lane, Cobham (Mar. 15); Pond Tail Farm, Downside, Cobham (Mar. 17); Highway Model Farm, Cobham (Mar. 18); Suma Poultry Farm, Hatchford, Cobham (Mar. 20).

Warwicks. 122, Tanworth Lane, Shirley, Solihull (Mar. 16).

Yorks. Brookfield Farm, Garforth Bridge, Leeds; Main Street, Saxton, Tadcaster (Mar. 17).

Swine Fever

Cambs. Church Farm, Chippenham, Ely (Mar. 16); 18, Pound Lane, Isleham, Ely (Mar. 17); 7, Quy Water Farm, Teversham (Mar. 21).

Devon. Alston Farm, Chardstock, Axminster (Mar. 16).

Flints. Sarn Farm, Rhuddlan, Rhyl (Mar. 21).

Glos. Pat-Yat Piggeries, Kemble, Cirencester (Mar. 17).

Hants. The Kennels, Sandford, Ringwood (Mar. 21).

Kent. Upper Pheasants Farm, Beacon Road, Luton, Chatham (Mar. 18).

Northants. Debdale Spring Farm, Great Doddington, Wellingborough (Mar. 16).

Somerset. Redlands Farm, East Coker, Yeovil (Mar. 21).

Staffs. Bank House Farm, Hyde Lea, Stafford (Mar. 17).

Suffolk. White House Farm, Darsham, Saxmundham (Mar. 16).

Surrey. Frosbury Farm, Gravett Lane, Worplesdon, Guildford (Mar. 15); Farleigh Piggeries, Farleigh Court Road, Warlingham (Mar. 17).

Sussex. Westub Farm, Balcombe, Haywards Heath (Mar. 16); Winfield Farm, Dittons Road, Polegate (Mar. 21).

Wilts. Fourways Farm, Beckhampton, Marlborough (Mar. 16).

Yorks. Prospect Farm, Crosshills, Keighley; Eastmoor Farm, Adel, Leeds, 16 (Mar. 15); High House Farm, Waxholme Road, Withernsea (Mar. 18).

LATE DELIVERY OF "THE RECORD"

Evidence is reaching us that the Post Office is failing to deliver copies within 24 hours of posting. Will readers whose "Records" arrive consistently late please write to the Editor?

Letters to the Editor

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

GENERAL

Cuffed Intratracheal Tubes in Small-animal Surgery

Sir,—Following an endeavour (described in your columns last year) to repair a ruptured diaphragm in a dog, without positive pressure apparatus, I have now acquired a set of intratracheal tubes with inflatable cuffs which I use in the manner described below. A representative of the British Oxygen Co. has told me that my technique is not common practice, and has suggested publication as being useful to other members of the profession.

A patient whose condition suggests anaesthetic risk is first premedicated with promazine hydrochloride or diethylthiambutene hydrochloride* intramuscularly, and anaesthesia is induced with thiopentone sodium† intravenously. The patient is then tubed and either oxygen is passed or the tube is left open to the atmosphere. An empty, large hypodermic syringe is attached to the small cuff-inflating tube. If respiration fails the main tube is connected to the oxygen supply and the plunger of the syringe is pressed, inflating the cuff and causing the oxygen to inflate the lungs. .The plunger is then released and the exhalation driven by the elastic recoil of the lungs escapes past the tube into the atmosphere, so obviating the need for CO_2 and H_2O absorption units.

In this way artificial respiration can be maintained indefinitely without fuss, with the use of one hand, leaving the other free to help with the operation which need not be interrupted. Using pure oxygen a slow rate and small amplitude are called for. If the anaesthesia lightens it is the work of a moment to turn on the ether or trichlorethylene, leaving the cuff deflated.

I found passing the tube very perplexing until I began to use an illuminated "Perspex" speculum (Bradley and Bliss Twinlite) which transforms it into a simple and positive procedure.

Yours faithfully,
HOLLAND BIRKETT.

50, Bridge Road,
Cove,
Farnborough,
Hants.

March 10th, 1960.

* Themalon. † Pentothal.

Treatment of Skin Infections

Sir,—Following a reference which appeared last year in THE VETERINARY RECORD (Fawcus, 1959) to the successful treatment with hexetidine* of skin infections in dogs, I determined to try the preparation in large animals.

Examination of the published literature revealed that laboratory studies had established the strong antibacterial, antifungal, and antitrichomonal activity of hexetidine *in vitro* and that trichophyton and microsporun, fungi responsible for ringworm infections, are particularly sensitive. The *in vitro* activity and safety of hexetidine was established by Ripps (1957) and Kral (1957, 1958). Amongst the cases treated by Kral were infections due to *T. mentagrophytes* and *T. equinum* in horses, and *T. verrucosum* in cattle.

I first used hexetidine on an Aberdeen Angus bull which had developed an acute eczemetous-like lesion of the hind quarters. The animal was bathed 3 times at 5-day intervals with a 0.5 per cent. solution. Immediate improvement occurred after the first application, the condition cleared completely after the third application, and there was no recurrence.

Subsequently I used the solution with satisfactory results in numerous cases of ectoparasitic infestation in large animals.

I have been unable to trace any reference to the previous use of hexetidine as a parasiticide, but I have used it satisfactorily in 6 cases of cattle infected with *Trichodectes bovis*. The infestation was completely eradicated by the use of the hexetidine solution.

It has proved particularly valuable as a shampoo prior to shows and sales, and I have found that 4 to 6 oz. is a satisfactory quantity for large animals. In view of the advent of the show season I think some of your readers will be interested in the use of hexetidine solution for this purpose.

Yours faithfully,
CLEMENT FENNELL.

High Street,
Odiham,
Hants.

March 16th, 1960.

References

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KRAL, E. (1957). *J. Amer. Vet. Med. Ass.* **130.** 41.
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* "Hexocil."

A Note on Professors

Sir,—Dr. J. C. Buxton is far too kind to his academic colleagues in his choice of collective nouns. The words he really needs are a "loquacity" of lecturers, and a "prolixity" of professors.

Yours faithfully,
D. L. HUGHES.

The University of Liverpool,
Department of Veterinary Pathology,
42-44 Bedford Street North,
Liverpool, 7.
March 22nd, 1960.

A Purchase Tax Warning

We are informed that purchase tax, hitherto levied on "Dictol," has been remitted as from March 18th. Those who have taken part in this correspondence, especially, will receive the news with satisfaction. We have been asked, however, to publish the letter below which was addressed to Mr. J. B. Edwards following his communication published in these columns on February 27th.

Dear Mr. Edwards,

I am writing to let you know that I have heard that my letter to you of February 16th about purchase tax on "Dictol," which was published in THE VETERINARY RECORD, may have been misinterpreted. I want to make it clear that the Ministry does know about the extensive field trials which were carried out in 1958 by the University of Glasgow Veterinary School and accepts the results of those tests without any reservation whatsoever.

In confirmation of this, I think the best thing I can do is to quote from a speech which was made by the Chairman of Allen & Hanburys Ltd. at a press conference on February 20th, 1959, to introduce the vaccine and which was authorised by the Minister. He said:—

"The Minister of Agriculture has expressed great interest in the developments about which you will be hearing this morning, and has extended his congratulations to all those in the University of Glasgow and in Allen & Hanburys who have contributed to the successful outcome of this pioneering work."

My letter was intended to deal simply with the question which you asked in your telegram about exemption from purchase tax. I intended to convey that the Ministry at the time considered that it did not know sufficiently of the value of "Dictol" when used on farms under varying conditions of animal husbandry to justify a favourable recommendation for exemption. No reflection whatever was intended on the scientific work carried out during the field trials.

I should be very grateful if you would help to correct any misunderstandings in this matter by giving the same publicity to this letter as you did to my last one.

Yours faithfully,
JEAN ARTHUR,
Private Secretary.

Ministry of Agriculture, Fisheries and Food,
Whitehall Place,
London, S.W.1.
March 11th, 1960.

Sir,—Some weeks ago you printed my letter complaining of the introduction of purchase tax on the husk vaccine known as "Dictol." Now I feel I must protest against its removal; and lest it be said that some people are never satisfied allow me to point out that orders of the vaccine between some date in January, and March 18th, are subject to tax, orders before or after that date are exempt. What price the foolish virgin in these non-biblical modern times? Naturally, from the tone of my letter, you will gather that the bulk of my orders were made at the correct time of year clinically but the wrong time taxably. Having suffered some embarrassment in explanations to clients over the increase in price, I feel that the Inland Revenue should be again approached and made to admit that no tax should ever have been applied, and rebates should be handed back all round.

I have contacted the company concerned, and depend on aid from the B.V.A. and all associated bodies who deservedly gain approval for their efforts so far in this direction. We must not sit on our posteriors with smug self-satisfied grins at a partial success. The Revenue authorities must be made to squirm and stand and deliver as we do annually. Can we, in general practice, acquire some support against these pin-pricks of officialdom? I, for one, protest.

Yours faithfully,
J. R. BENNET.

Coopers Lane,
off Waterside,
Evesham.
March 21st, 1960.

"As Boyd has said . . ."

Sir,—In former times it was the usual custom, when dealing with a student who was not particularly well-informed on some specific point, to recommend him to take himself off to digs or library and there spend a few cool hours reading the topic up. And from the time of Abernethy downwards, "get your book and use your damned optics and your blasted mother wits," or some similar injunction, has been the generally accepted form in which this very useful piece of advice has been handed on.

But just how difficult it is to put this excellent precept into practice at the present day I discovered very recently while attempting to get myself abreast of new developments in a particular branch of veterinary science. And the difficulty did not arise because of any marked defect of will or optics on my part but from the fact that the book in which I attempted to do the reading up—*the* book, the first and foremost one on the subject, it was said—was utterly deficient in everything that a book should be.

In common with all other workers, I have occasionally been obliged to struggle with texts of some considerable complexity and this has generally been due either to the fact that the subject was complex in itself, or that the work in question was written in one of the lesser known foreign languages. In these cases there is nothing for it but to plod on doggedly, finger in lexicon, and trust that in the end the results will be worth the labour.

But I will not construe, and I will not be put to the labour of reading with a commentary and a conscience, when it comes to consulting what is supposed to be a straightforward text-book addressed to students and general practitioners. I will not reread a sentence half a dozen times in order to try to find out what, if anything at all, is intended by it. Nor will I go stumbling on through a farrago of jargon strung together on a barbarous syntax in the faint hope that I may possibly find out something new.

And, moreover, I will most certainly not be imposed upon in this way by a work which sets itself out to be "a text and a reference book," which costs £6 sterling, which is decked out with dedications and prefaces, and which purports to be the work of no fewer than 40 authors.

To take examples in point: "In the case of the distemper virus, it is specifically attracted to invade epithelial cells, which are not so vital to life as neurons are in the brain stem in poliomyelitis." Admittedly, the sense of the first part glimmers faintly through, that the distemper virus has an affinity for the epithelium in which it gives rise to pathological changes. But what about the rest of the slipshod sentence, the piece about the neurons? What is meant here? Does it mean that neurons are particularly vital to life during attacks of poliomyelitis, is it only then that they are so, or is this always the case? Or is it to be taken to mean that neurons generally are always more important to the organism than epithelial cells? And if the latter surmise is correct one immediately asks one's self why the author has been to such manifest pains to establish such a trumpery point at such a late hour of the night.

Again: "Whatever the cause may be—distemper or any other virus—the findings in fulminating canine encephalitis correspond to those of a frank inflammatory nature, like those in a number of virus encephalitides." What in the name of mumbo-jumbo does this mean? Does it mean anything in the very least? Anything which, had it been worth saying at all, could not have been expressed in a way which would have impressed itself on the mind for ever?

I do not ask these questions on my own behalf; I am in the fortunate position of being able to toss such a book aside and refuse to tolerate it. It is not for my benefit that I raise this matter, but for that of the student—the student who has been sent to read his book and who, perhaps, can find none other, the student who has to struggle and construe, get hold of the wrong end of the stick, perhaps, and wonder why he cannot grasp the subject and why he is not making progress.

This is a matter of the most outstanding importance. As a student reads so he will write, and it is useless—it is certainly manifestly unfair—to hold up the average student's literary efforts to odium and ridicule while at the same time giving him such daily reading as this. By allowing students to absorb a book of this calibre and unconsciously store it up and use it as a model for their future writings we are simply creating a forcing house for yet another generation of jargon-writing scientists whose labours will only obscure and never illuminate the progress of science. "As ye sow so shall ye reap."

. . . But the book has taken the words out of my mouth. "As *Boyd* has said"—there is this in the book, too—"As Boyd has said, 'By their fruits ye shall know them.'" To which, Heaven knows, all that one can answer is, "Every tree that bringeth not forth good fruit is hewn down, and cast into the fire"—as Ramsay Macdonald put it in his inimitable way all those centuries ago.

Yours faithfully,
R. H. A. MERLEN.

Royal Veterinary College,
Royal College Street,
London, N.W.1.
March 15th, 1960.

Laparo-orchidectomy in the Horse with Abdominal Cryptorchidism

Sir,—It was with great interest that I read Professor Wright's paper on "Laparo-orchidectomy in the Horse with Abdominal Cryptorchidism" (*Vet. Rec.* **72.** 57), especially because he used the surgical approach suggested by Hutchins (*Aust. Vet. J.* **32.** 149) as probably being superior to flank laparotomy in such cases.

However, I must beg to differ from the author regarding the value of rectal examination in the diagnosis of cryptorchidism, because I have found this procedure to be of great value in ascertaining the position of the retained testicle(s). Admittedly my experience has been limited, and the animals examined have been Thoroughbreds or hacks, whereas many of the horses examined by Professor Wright were ponies, which were probably very fat.

Rectal palpation is facilitated by the use of low epidural anaesthesia, which usually eliminates straining and thereby facilitates the identification of abdominal structures, but even without this aid the internal inguinal ring can be palpated (I frequently have identified this structure, when conducting routine rectal examinations on geldings and stallions suffering from colic).

The most useful guide to the position of the retained testis is obtained by the palpation of the internal inguinal ring which is found just anterior to the pelvic inlet. If the testis is abdominal in position no spermatic cord passes through this aperture, whereas in the case of a normally-positioned or inguinal testis the cord can be palpated. In addition, abdominal testes may be identified if they are not grossly abnormal and/or out of easy reach.

These remarks may be construed to constitute a trivial criticism of a very fine paper, but I believe that in many cases a definite diagnosis of the position of retained cryptorchid testes can be made by rectal examination, thus facilitating subsequent surgery.

Yours faithfully,
B. L. MUNDAY.

Department of Agriculture,
Box 84,
King Island,
Tasmania.
March 14th, 1960.

The Royal Veterinary College Association

Sir,—I crave your indulgence so that I can bring to the notice of all "Old Students" of the Royal Veterinary College that the annual re-union and dinner of the R.V.C.A. will be held at the Camden Town School on Friday, May 6th.

It is our pleasure and privilege to pay tribute on these occasions to some distinguished "Old Londoner" who has served his College and the profession well. The guest of honour this year will be Mr. E. Brayley Reynolds. Brayley Reynolds has brought honour to his College and to the profession and we are proud that he was a student and also a member of the staff of the R.V.C.

I hope that as many members as possible will be at Camden Town on May 6th to salute him and give expression of their regard.

Old students and members of the staff, past and present, who have not yet joined the Association will be welcome also. They can repair their "deed of omission" easily by becoming members of the Association. Life membership subscription is one pound (£1).

In order to facilitate the catering and other arrangements it is important that those who intend to be present should notify the Secretary, Mr. E. K. Price, or the Treasurer, Lt.-Col. D. A. Green, as soon as possible.

A formal announcement of the occasion will be found elsewhere in this journal.

Yours faithfully,
J. McCUNN,
President.

Royal Veterinary College Association,
Royal College Street,
London, N.W.1.
March 21st, 1960

SCIENTIFIC

Warble Larvae in Grant's Gazelle

Sir,—In September, 1959, we shot near Kajiado, Kenya, a young male Grant's gazelle (*Gazella granti*). Numerous small lumps, recognisable from several yards away by the disturbed hair pattern, were present under the skin on both sides of the vertebral column.

Each lesion was caused by a large segmented yellowish to brown larva lying just below and adherent to the skin. About 100 larvae were present; each was about 2.5 cm. long and all but the last 3 segments possessed a transverse pad of small spines. The posterior end of each larva, carrying the stigmatal plates, pointed toward the skin surface and some had protruded slightly through the skin. Efforts to identify the larvae are in progress.

Subsequently, with the co-operation of the Game Department, 2 immature and 2 mature males were shot in the same area. One of the former was infected with one larva. In the mature males several whitish rounded scars were noted in the fascia overlying the longissimus dorsi muscles. These could have been caused by larvae.

This is apparently the first record of "warble-fly" larvae in indigenous cloven-hoofed animals in East Africa, although Lewis (1933) has recorded the presence of *Hypoderma* larvae in cattle newly imported into Kenya from Britain. There are no records of the disease in indigenous cattle. The parasite was new to senior members of the Game Department, the Hides and Skins Department, the Coryndon Museum, and to Kenya's leading taxidermist. We should be interested to learn if any reader has observed similar larvae in East African gazelles as it may establish whether or not the parasite is of recent origin.

Yours faithfully,
G. M. URQUHART,
D. HAY.

East African Veterinary Research Organisation,
Muguga,
Kenya.
March 18th, 1960.

Reference

LEWIS, E. A. (1933). *Bull. ent. Res.* **24**. 263.

ADVERTISERS' ANNOUNCEMENTS

GLAXO LABORATORIES LTD. announce that a combined procaine penicillin and dihydrostreptomycin injection known as Streptopen Injection, will now be available to veterinary surgeons. The preparation contains 250,000 units procaine penicillin and 0.25 grammes dihydrostreptomycin as sulphate per ml. and is of advantage when treating bacterial infections of mixed origin.

CIBA LABORATORIES LTD. announce the availability of Vecortenol brand prednisolone trimethylacetate. It can replace other corticosteroids to advantage in such conditions as bovine ketosis, mastitis, and agalactia in sows, dermatoses in small animals, and arthritis. It is available as a microcrystalline suspension in rubber-capped vials containing 100 mg. in 4 c.cm. and 250 mg. in 10 c.cm.

DISEASES OF ANIMALS ACT, 1950—GREAT BRITAIN
Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period		Anthrax	Atrophic Rhinitis	Foot-and-Mouth	Fowl Pest	Sheep Scab	Swine Fever
1st to 15th Feb., 1960		9	—	2	174	—	45
Corresponding period in	1959	9	—	—	67	—	41
	1958	7	—	36	32	—	33
	1957	19	2	1	37	—	39
1st Jan., to 15th Feb., 1960		31	—	7	623	—	139
Corresponding period in	1959	21	—	—	147	—	125
	1958	22	—	79	152	—	139
	1957	51	2	11	162	—	109